

Amendments to the Specification

The paragraph starting at page 1, line 8 and ending at line 19 has been amended as follows.

It has been known that some of plain copying machines, copying machines having the copying function as well ~~facsimile~~ a facsimile function, image scanners, or the like, are equipped with such an image reading apparatus that is capable of scanning an original in the form of a sheet in two different methods: a method in which an original is stationarily placed on an original placement glass platen and is scanned by moving an optical reading system, and a method in which an original is moved by an automatic document feeder (ADF) or the like and the moving original is scanned by a stationarily placed optical reading system.

The paragraph starting at page 1, line 20 and ending at line 26 has been amended as follows.

Referring to Figure ~~6~~ 16, an image reading apparatus such as the one described above is provided with an image reading unit comprising a contact type image sensor (CIS) 1. The contact type image sensor 1 is placed in contact with an original placement glass platen and reads an original. It is placed under the original placement glass platen 2.

The paragraph starting at page 5, line 6 and ending at line 26 has been amended as follows.

Further, as pressure is applied by a holding/pressing plate 102 upon a relatively thick book placed on the glass platen to copy its pages, a load of approximately 98 N ~~applies~~ is applied to the original placement glass platen 2. In such a situation, the glass platen (which is as large as the size of an A3 paper, and is 4 mm in thickness) deforms downward, causing its center portion to displace downward approximately 0.8 mm, even though the distance between the contact type image sensor 1 and glass platen 2 remains unchanged. This downward deformation of the original placement glass platen 2 causes the aforementioned reflected light to be misfocused upon the photodetector array 13 while the contact type image sensor 1 is moved across the center portion of the original placement glass platen 2. In order to prevent this problem, the jump step 3 as a stay is required to have the function of reinforcing the original placement glass platen 2 in order to prevent the deformation of the original placement glass platen 2.

The paragraph starting at page 8, line 24 and ending at line 27 has been amended as follows.

Figure 1 is a ~~phantom~~ sectional drawing of the image forming apparatus in accordance with the present invention, as seen from the front side of the apparatus.

The paragraph starting at page 9, line 4 and ending at line 6 has been amended as follows.

Figure 3 is an enlarged ~~phantom~~ sectional view of the image reading portion of the image forming apparatus in accordance with the present invention.

The paragraph starting at page 9, line 7 and ending at line 10 has been amended as follows.

~~Figures 4(a) and 4(b)~~ In Figure 4, A and B are ~~phantom~~ sectional views of the image reading portion of the image forming apparatus in accordance with the present invention, ~~and shows~~ showing the internal structure thereof.

The paragraph starting at page 9, line 14 and ending at line 18 has been amended as follows.

~~Figures 6(a) and 6(b) are~~ Figure 6 is a schematic perspective ~~views~~ view of the essential portions of the contact type image sensor and jump step, in the image reading portion in accordance with the present invention, and shows the positioning and structures thereof.

The paragraph starting at page 9, line 25 and ending at page 10, line 2 has been amended as follows.

~~Figures 8(a) and 8(b)~~ In Figure 8, (a) and (b) are schematic drawings showing the behavior of a comparative example of a contact type image sensor, during the period in which the contact type image sensor is displaced downward away from the original placement platen.

The paragraphs starting at page 10, line 10 and ending at page 10, line 22 have been amended as follows.

~~Figures 11(a)~~ In Figure 11, (a), 11(b) (b), and 11(c) (c) are schematic drawings showing the configuration and measurement of the ~~through hole~~ through-hole of the horizontally protruding portion of the contact type image sensor in accordance with the present invention.

~~Figures 12(a)~~ In Figure 12, (a), 12(b) (b), and 12(c) (c) are schematic drawings showing the various jump step structures compatible with the image reading apparatus in accordance with the present invention.

~~Figures 13(a)~~ In Figure 13, (a) and 13(b) (b) are schematic drawings showing a concrete example of the guided member in the image reading portion in accordance with the present invention.

The paragraph starting at page 11, line 23 and ending at page 12, line 3 has been amended as follows.

Figure 1 is a ~~phantom~~ sectional view of the image forming apparatus in accordance with the present invention, as seen from the front side of the apparatus, and Figure 2 is a perspective view of the image forming apparatus in accordance with the present invention. Figure 3 is an enlarged ~~phantom~~ sectional view of the image reading portion of the image forming apparatus in accordance with the present invention.

The paragraph starting at page 12, line 6 and ending at line 23 has been amended as follows.

Referring to Figures 1, 2, and 3, a referential code (or reference numeral) 101 designates the main assembly of the image forming apparatus, and a referential code 102 designates the holding/pressing plate of an ADF (automatic document feeder). The ADF separates one by one the plurality of originals D in the form of a sheet stored in layers therein, and conveys each sheet or original D. A referential code 103 designates an image reading portion which reads the surface of the original in the form of a sheet, or the surface of a given page of the original in the form of a book, on the original placement glass platen of the image reading portion, and a referential code 104 designates the main assembly of the image forming apparatus which employs an electrophotographic printing method which

employs an LED array. A referential code 105 designates a control panel comprising a display, a set of input keys, and the like.

The paragraph starting at page 14, line 18 and ending at page 15, line 14 has been amended as follows.

A referential code 119 designates the joint between the image reading portion 103 and image forming apparatus main assembly 104, and a referential code 120 designates a control portion of the image forming apparatus, or a ~~facsimile~~ facsimile apparatus, and a referential code 121 is a path through which an original is conveyed when reading the original by moving the original. A referential code 122 designates a cover for exposing the path through which a recording medium is conveyed in order to form an image on both surfaces of the recording medium, and a referential code 123 is a recording medium conveyance direction switching portion for switching the recording medium conveyance direction in order to form an image on both surfaces of the recording medium. A referential code 124 designates a recording medium registering portion for releasing a recording medium in synchronism with the starting of the image formation on the photoconductive drum, and a referential code 125 designates a sheet feeding portion, which is disposed within the image forming apparatus main assembly 104 and is capable of handling a plurality of recording medium sheets different in size.

The paragraph starting at page 16, line 22 and ending at page 17, line 4 has been amended as follows.

Referring to ~~Figures 4(a) and 4(b)~~ (A) and (B) of Figure 4, the contact type image sensor 108 is movable in the left and right directions of the apparatus, following the guide shaft 103c. It can be moved to any point within its movable range by a driving pulley 103b and an unshown motor. The contact type image sensor 108 is supported by the guiding shaft 103c with the interposition of a carriage 103a, being kept under the upward pressure generated by a spring 103e as a pressure generating means.

The paragraph starting at page 22, line 22 and ending at line 26 has been amended as follows.

On the other hand, each of the widthwise end portions (portions outside image reading range) of the contact type image sensor 108 is provided with a protrusion 108b, which is provided with a ~~through hole~~ through-hole 108c.

The paragraph starting at page 23 line 14 and ending at line 25 has been amended as follows.

Regarding the rigidity of the jump stop 109b, the following has been known. That is, assuming that 4 mm thick chemically reinforced glass is used as the material for

the original placement glass ~~platens~~ platen 107 capable of handling an original as large as an A3 sheet, in order for the jump step 109b to function as a stay for preventing the original placement glass platen 107 from flexing, in terms of its widthwise direction, the following equation must be satisfied:

$$E \cdot I = 6.5 \times 10^6 \text{ kg.mm}^2$$

E: Young's modulus

I: second moment of area.

The paragraph starting at page 30, line 12 and ending at line 20 has been amended as follows.

As a result, it became possible to keep the contact type image sensor 108 stable during its movement in order to maintain the image reading performance of the contact type image sensor 108[[,]] at an optimal level. Also, the contact type image sensor 108 could be smoothly displaced downward from the original placement glass platen 107 or 109, and placed back in contact with the original placement glass platen 109 or 107, respectively.

The paragraph starting at page 32, line 18 and ending at line 24 has been amended as follows.

Further, as the contact type image sensor 108 becomes tilted as described above, the wall of the ~~through hole~~ through-hole 108c and boss 103g scratch each other, as shown in ~~Figures 8(a) and 8(b)~~ Figure 8, making it more difficult for the contact type image sensor 108 to be smoothly displaced downward from the original placement glass platen 107 or 109.

The paragraphs starting at page 34, line 15 and ending at page 35, line 24 have been amended as follows.

Next, referring to Figure 11, the measurements and configuration of the ~~through hole~~ through-hole of the protrusion 108b of the contact type image sensor 108 will be described. Figure 11 is a schematic drawing for showing the measurements and configurations of two types of ~~through holes~~ through-holes 108c. Figure 11(a) is a perspective view of the portion of the contact type image sensor 108 adjacent to the ~~through hole~~ through-hole 108c, and Figure 11(b) is a section view of the contact type image sensor 108 at a plane A in Figure 11(a). Figure 11(c) is a sectional view of a contact type image sensor different in the configuration of the ~~through hole~~ through-hole from the one in Figure 11(b), at plane A in Figure 11(a).

As shown in the drawings, in this embodiment, the thickness t_2 of the lip portion of the ~~through hole~~ through-hole 108c is set to be less than the thickness t_1 of the protrusion 108b itself. More specifically, the thickness t_2 was set to no more than 2 mm, whereas the thickness t_1 was approximately 3 mm.

With the provision of this setup, the boss 103g was afforded more latitude in its tilting movement relative to the protrusion 108b in the direction indicated by an arrow mark Q in the drawing. Therefore, the amount of the scratching which occurs between the wall of the ~~through hole~~ through-hole 108c and the boss 103g is reduced, making it possible to smoothly displace downward the contact type image sensor 108 from the original placement glass platen 107 or 109, and placed back in contact with the original placement glass platen 109 or 107, respectively.

Next, referring to ~~Figures 12(a), 12(b), and 12(c)~~ Figure 12, concrete examples of the configuration or the like of the jump step 109b will be described. ~~Figures 12(a), 12(b), and 12(c) are~~ Figure 12 is a schematic drawings drawing showing the various jump steps in accordance with the present invention, different in configuration.

The paragraphs starting at page 36, line 14 and ending at line 20 has been amended as follows.

Next, referring to ~~Figures 17(a) and 17(b)~~ Figure 13, a concrete example of the configuration for the guided member 108d in accordance with the present invention will be described. ~~Figures 13(a) and 13(b) are~~ Figure 13 is a schematic drawings drawing showing a concrete example of the guided member 108d, ~~Figures 13(a) (a) and 13(b) (b)~~ being perspective and sectional views, respectively.

The paragraph starting at page 36, line 21 and ending at page 37, line 3 has been amended as follows.

As shown in the drawings, the guided member 108d comprises two members: rollers 108d3, and a member having both a shaft portion ~~108d~~ 108d1, around which the roller 108d3 is fitted, and a snap fitting portion 108d2. On the other hand, the protrusion 108b1 is provided with a pair of snap fit holes 108b2, which are located adjacent to the ~~through-hole~~ through-hole 108c, and into which the pair of actual snap fitting portions of the snap fitting portion fit. Therefore, the guided member 108d is easily attached to the protrusion 108b1.

The paragraph starting at page 37, line 10 and ending at line 18 has been amended as follows.

While the invention has been described with reference to the structures disclosed herein, it is not confined to the details set forth, and this application is intended to cover such modifications or changes, regarding the measurements, materials, configurations, positional relationship, and the like, of the structural components, as may come within the purposes of the improvements or the scope of the following ~~Claims~~ claims.